



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/021,688
Applicant : Garstenauer et al.
Filed : December 11, 2001
Title : Variable Hydraulic Valve Drive
Art Unit : 3754
Examiner : Bastianelli, John
Docket No. : TRG-300

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

In compliance with the duty of disclosure under 37 C.F.R. §§ 1.56 and pursuant to 37 C.F.R. §§ 1.97 and 1.98, it is respectfully requested that this Information Disclosure Statement be entered and the documents listed on the attached form PTO-1449 be considered by the Examiner and made of record. It is believed that no fee is due at the present time as this statement is being filed under 37 C.F.R. § 1.97(b). However, should any fee be missing or insufficient, authorization is hereby given to charge said fee (or credit any overpayment) to deposit account number 12-2147.

Filed herewith are copies of the references listed on form PTO-1449. In compliance with 37 C.F.R. § 1.98(a)(3)(i), the following abstracts/explanations are provided for the non-English language references. For reference WO 84/01651, an English abstract is provided on the front page of the reference.

DE 30 15 005 A1:

A linear tracking arm assembly for linearly tracking a recording medium in response to manual or automatic lead-in and return indications, which includes a linearly movable conveyer means carrying thereon a pick-up arm. The linearly movable conveyer means is driven by an electro-magnetic linear motor. An electric brake means is provided on the conveyer means, for applying a suitable brake to the electro-magnetic linear motor in accordance with a speed of the conveyer means.

DT 2 105 542:

A apparatus for producing glass peaks from a thin glass rod by heating and extracting the same, characterized in that both ends of the glass-rod are held by a holding device which is interlinked through a guidance whereby at least one holding device is movable in axial direction of the glass rod within the guidance.

DE 33 07 070 A1:

A method and apparatus for starting and regulating valve systems for displacement type machines such as fuel-regulated internal combustion engines wherein a valve can be held in at least two final operational positions. The valve systems are each designed as an oscillating spring/mass system such that periodic force components or travel path excitations can be communicated to the spring/mass system in its original starting position or in a static home position. The pulse characteristics or frequency of the force components or excitations are close or equal to the natural frequency of each

spring/mass valve system, so that the valve system is caused to oscillate with increasing amplitude and is thus excited into one of the two final operational positions.

DE 37 39 775 A1:

An arrangement for actuating the gas-reversing valves of a reciprocating internal combustion engine is described, which in each case has an adjusting piston which acts on a valve shaft of the valve against a valve-closing spring and which can be acted upon by a pressure medium situated in a pressurization chamber. In order to be able to keep the output and the delivery capacity of a pressure-medium pump, which is provided for the subsequent delivery of pressure medium into the pressurization chamber, as small as possible, a locking device is to be provided, which fixes the adjusting piston in its end positions which are respectively assigned to the opened and the closed position of the valve and which can be triggered for its release depending upon the operating state of the internal combustion engine.

DE 2 008 668:

Pressurized liquid is used to control inlet- and outlet valves of an internal combustion engine. A solenoid valve blocks the supply when in rest-position and connects the working piston with the reflux and analogously blocks the reflux and connects the supply with the piston in work-position. To enable a high flow-rate, supply and reflux are connected with the piston through bypassing channels.

DE 39 09 822 C2:

The engine valves of an internal combustion engine are actuated and controlled by means of hydraulic cylinders, which are connected by lines to the corresponding pump cylinders of an injection pump. In this way optimum control of the engine in terms of exhaust emissions and consumption can be achieved, especially by adjusting the pump delivery by way of the control rod of the injection pump.

DE 38 33 459 A1:

A hydraulic valve gear for an internal combustion engine has a working piston connected to the valve, which piston in a cylinder defines a pressure chamber, in which a compensating piston is displaceably arranged. At the end of the closing movement of the valve 1, the working piston immerses with an end section in a hollow space of the compensating piston, forming a restrictor gap, as a result of which a braking action is obtained. Hydraulic length compensation is achieved in that the compensating piston in the rest position of the valve and the working piston is pressed by a spring against a stop on the working piston and the thereby enlarging space is filled with hydraulic fluid by way of the non-return valve.

DE 38 36 725 C1:

A hydraulically operating actuating device for a lift valve, in particular in an internal combustion engine, has a piston, which is connected to the valve stem. The piston is positioned in a cylinder and separates two stroke spaces that are connectable, in each case via inlet and outlet openings that can be occluded by the piston, to a pump for the

working fluid or a reservoir. In order to reduce the energy requirement of the actuating device, the two inlet openings, which in a central actuation range of the piston are open, are connected to one another directly by a line, and two springs which act in opposite directions and, in equilibrium, hold the piston in a central position relative to two end positions engage on the piston or valve stem.

EP 0 191 376 A1:

Electromagnetic valve drive for a combustion engine, having a first electromagnet, which is excitable as a function of the operating parameters, more particularly in synchronism with the motor speed, and an armature which can be attracted by the first electromagnet, characterized by a displacement path of the armature of approximately 1-1.5 mm, a first piston, which slides in a first hydraulic cylinder and is connected with the armature, a second piston which acts on the valve shaft, has a diameter (d/D), diminished in relation to the first piston, and slides in a second hydraulic cylinder, and also a line which connects the first and the second hydraulic cylinder one with the other.

DT 2 006 618:

A valve-actuating mechanism for an internal combustion engine has a number of rocker arms for operating the respective valves, each rocker arm having a profiled cam surface for engaging the respective valve, and means, preferably hydraulically operated, for varying the valve movement produced by the rocker arm in dependence upon the engine speed and load to vary the valve timing for optimum efficiency.

DT 23 63 891 A1:

A crankshaft and a rod are used for adjusting valves in an internal combustion engine according to a mechanical principle. The rod is sustained on a stationary supporting wall while back and forth movement.

DT 24 28 915 A1:

A crankshaft and a rod are used for adjusting valves in an internal combustion engine according to patent number DE 23 63 891. One single eccentric tappet controls the stroke and the opening time of inlet and outlet.

DE 368 775:

This patent discloses a mechanical height-adjusting apparatus for aviation engines. The amount of the fuel mixture is controlled by a valve subject to the atmospherical pressure in the piston of the engine.

DE 31 26 620 A1:

This invention relates to a timing variator device for an internal combustion engine, comprising a coupling between the cam shaft and the drive gear, which is capable of making angular movements between the coupled parts according to the rotational speed, and in which said movement is actuated by the engine lubricating oil under the control of a valve element constituting the member sensitive to the engine speed.

DE 33 26 096 A1:

In a four-stroke internal combustion engine, in particular a high-speed engine for a passenger vehicle, in which engine the stroke movement of the valves which serve to control the gas exchange is positively controlled with a camshaft which is driven by a crankshaft in accordance with the crank angle and preferably via a toothed belt or chain drive, according to the invention a coupling is arranged between the drive of the transmission, connecting the crankshaft to the camshaft, and the camshaft, the half of which coupling which is fixed on the camshaft engaging positively in rockers which are swivellably mounted on the power take-off and pretensioned in such a way that, when the idling speed is exceeded, the rockers which are deflected by the centrifugal force move the half of the coupling that is seated on the camshaft with the effect of displacing the ignition time of the valves towards a smaller crank angle.

DE 34 15 245 A1:

Herein disclosed is a valve actuating mechanism having a stopping function for use in an internal combustion engine of the type, in which at least one pair of intake or exhaust valves having an identical function and disposed adjacent to each other are arranged for one cylinder. First and second rocker arms respectively having arms abutting against the upper ends of the paired intake or exhaust valves are rockingly supported on a common support shaft which is fixed on the engine body while having an axis perpendicular to the operating directions of the valves. The first rocker arm is formed with a cylinder bore which is opened toward the second rocker arm to bear a plunger therein whereas the second rocker arm is formed with a guide bore which is opened

toward the first rocker arm to fit the plunger therein. A hydraulic actuation chamber defined between the bottom portion of the cylinder bore and the rear end of the plunger is connected with an oil-pressure source through a hydraulic changeover valve for changing the supply and stop of the oil pressure to the actuation chamber. Either of the first or second rocker arm is formed with a cam slipper for sliding contact with a cam which is adapted to rotate in accordance with the run of the engine.

DE 38 00 347 A1:

A valve-operating device for an internal combustion engine having a drive rocker arm operatively associated with an intake or exhaust valve and a free rocker arm releasable from the intake or exhaust valve. The drive rocker arm and the free rocker arm are disposed adjacent to each other and operable selectively in mutually different modes according to the rotation of the camshaft. In one embodiment either the drive or free rocker arm has two arms connected together with one arm on each side of the other rocker arm for balanced loading. A selective coupling mechanism is disposed between the drive rocker arm and the free rocker arm for selectively connecting and disconnecting them with a coupling pin movable in a direction substantially normal to the axis of the rocker shaft.

DE 40 36 279 A1:

A valve mechanism has a low-speed cam and a high-speed cam, a low-speed rocker arm operatively connected a valve and a high-speed rocker arm. A changeover device is provided for connecting the low-speed and high-speed rocker arm with each other so

as to be rocked together by the high-speed cam. A roller follower is rotatably mounted on a shaft provided in the low-speed rocker arm. The high-speed rocker arm has a slipper engaging with the high-speed cam. The changeover device has a piston slidably mounted in the high-speed rocker arm so as to connect the high-speed rocker arm with the low-speed rocker arm.

DE 36 21 080 A1:

At least one of two inlet valves provided per cylinder of a multi-cylinder internal combustion engine is operated using a variable valve timing device. This device is controlled in response to the load and rotational speed of the engine in a manner which reduces the lift of the valve at low engine speeds and stepwisely increases the same as the engine moves from one mode of operation to the other. In the event that only one valve is controlled this valve is selected to be the one other than that which generates swirl in the combustion chamber.

DT 21 01 542:

A self-adjusting hydraulic tappet is used for changing operating conditions in internal combustion engines. A variable discharge of hydraulic liquid controls the stroke.

DE 29 26 327 A1:

Herein disclosed is a valve-controlling apparatus through mechanical/hydraulic means in combustion engines. A working chamber with hydraulic liquid is interposed between

two pistons and connected with a pressure vessel in order to maintain a constant hydraulic pressure.

DE 40 02 856:

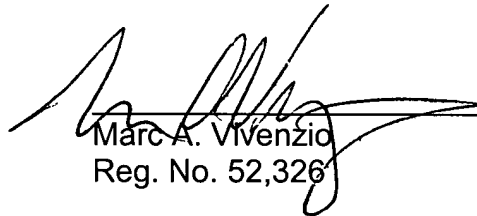
The device incorporates a rotary valve with a driven outer control sleeve and a synchronously driven inner control sleeve installed concentrically with the latter. For variable control the rotational angles of both sleeves are adjustable in relation to each other and provide a connection between the working chamber and pump via a shut-off valve to open the engine valve. With closing of the engine valve, the outer sleeve serves as a connection between the working chamber and a spring accumulator, via another shut-off valve. Use and advantage is the hydraulic control of valve in IC engines combined with energy recuperation.

While this statement contains all of the relevant information presently known to the Applicants, it should not be interpreted as a representation that an exhaustive search has been conducted or that no other relevant information exists. Moreover, the Applicants invite the Examiner to make an independent evaluation of the cited references to determine their relevance to the subject matter of the present application.

Finally, the Applicants urge that their claims are patentably distinguishable over all disclosed relevant information or any combination thereof.

Respectfully Submitted,
Lorusso Loud & Kelly LLP

Dated: March 23, 2004

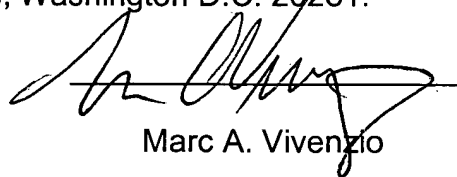


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CERTIFICATE OF MAILING

I hereby certify that this Information Disclosure Statement and any paper or document referred to therein as being attached or enclosed, is being deposited on March 23, 2004 with the U.S. Postal Service as First Class Mail under 37 C.F.R. 1.8 in an envelope addressed to: The Assistant Commissioner for Patents, Washington D.C. 20231.



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				Garstenauer et al.			
				FILING 12/11/2001		GROUP 3754	

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 PATENT & TRADEMARK OFFICE

U.S. PATENT DOCUMENTS							
*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		4,375,793	03/08/1983	Seilly et al.			
		5,193,495	03/16/1993	Wood, III			
		5,275,136	01/04/1994	Schechter et al.			
		5,829,396	11/03/1998	Sturman			
		4,231,330	11/04/1980	Garcea			
		5,103,779	04/14/1992	Hare, Sr.			
		5,272,136	12/21/1993	Mandai et al.			
		4,231,130	11/04/1980	Tobita et al.			

FOREIGN PATENT DOCUMENTS								
		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
		DE 33 07 070 A1	09/06/1984	Germany				✓
		EP 0 390 519 A1	10/03/1990	Europe			✓	
		DE 37 39 775 A1	06/26/1988	Germany				✓
		DE 2 008 668	09/09/1971	Germany				✓
		DE 39 09 822 C2	09/27/1990	Germany				✓

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			

EXAMINER	DATE CONSIDERED
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

